



## Cotton Yields

This EnviroAtlas national map displays the thousands of tons of cotton that are grown annually within each 12-digit hydrologic unit (HUC). It is based on the United States Department of Agriculture's 2010 Cropland Data Layer (CDL) and yield estimates from the National Agriculture Statistics Service (NASS) 2007 census and survey data.

### Why are cotton yields important?

Yields are an important measure of agricultural productivity because they measure the actual output of farms. Crop yields in the U.S. have increased dramatically from the mid-twentieth century to the present, mostly as a result of technological advances.

Cotton is a significant crop; it is the most commonly used natural fiber, and it accounts for  $\frac{1}{3}$  of the world's fiber demand.<sup>1</sup> In addition to providing fiber, cotton seeds are used to produce animal feed and an edible oil.

Total cotton production increased for many decades because of improved technology and farming practices, but it has begun to decline in the past decade due to changes in the global marketplace and other relatively more valuable crops replacing cotton. However, the U.S. is still one of the leading cotton producers and the leading cotton exporter. In addition, cotton yields per hectare have been increasing. The U.S. was ranked as the third leading-cotton producing country in 2014/2015 behind China and India.<sup>2</sup> Within the southern U.S. states, Texas and Georgia were the leading cotton producers in 2015.<sup>2</sup> Since the late 1990s, the use of cotton by U.S. textile mills has been declining, but cotton is increasingly exported to textile mills in other countries.<sup>1</sup>

Knowing the cotton yields for a hydrologic unit can be useful for analyzing the economic impacts of agriculture in a region. The income from farms affects a wide group of stakeholders, including the farmers themselves, farm laborers, lenders, landlords, and the government. In particular, farms can contribute to the economic well-being of rural communities. Non-metro areas tend to have higher poverty rates than metro areas, and many rural counties that have the highest rates of job growth also have a high percentage of agricultural jobs.<sup>3</sup> The cotton industry, including textile manufacturing as well as farming, generates around 200,000 jobs per year.<sup>1</sup>



The value of cotton can change quickly; because most of it is now exported, it is sensitive to global economic changes and trade policies. The total amount of land used for cotton farming had been rising for several decades, but it has been falling since 2006 as other crops have become relatively more valuable. As it has with many other crops, cotton farming has become increasingly specialized and concentrated on larger farms, with the number of small cotton farms decreasing while the cotton acreage per farm increases.

### How can I use this information?

This map, Cotton Yields, is one of several maps that provide information about the agricultural productivity of each 12-digit HUC. Additional EnviroAtlas maps show fruit, vegetable, and grain yields; the number of types of fruits, vegetables, and grains grown; the hectares of land used for fruit, vegetable, cotton, and grain crops; and the value of cotton and grain produced.

This map can show users where cotton is heavily produced in the contiguous U.S. or how many tons of cotton are produced per HUC. The data presented in this map could be used to estimate the economic impacts of agriculture in a region. The data could also be used in conjunction with other maps in EnviroAtlas. For example, it could be compared with maps showing nitrogen deposition or stream impairments to see how cotton production may potentially affect air and water quality.

## How were the data for this map created?

Cotton yield estimates for states and counties were obtained from NASS and converted to tons per hectare. These were added to the [CDL](#) raster map, which shows crop types. If cotton did not have county-level NASS yield data, state yields were used; if there was no county or state-level yield data available, national yield data was used. Yields for cotton were then summed by 12-digit HUC.

## What are the limitations of these data?

The Crop Data Layer map is produced using satellite imagery, rather than farmer-reported data, and it is an estimation of the truth based on the best available science. The NASS data on crop yields were not available at the county level for the entire contiguous United States; state and national yields were used in these instances. However, due to wide variations in yields throughout the United States, national and state values might not accurately reflect yields at county levels. Calculations based on these data are therefore also estimations.

Farms do not necessarily produce the same crops every year; this map might not reflect the current cotton yields for a 12-digit HUC. Periodic updates to EnviroAtlas will reflect improvements to nationally available data. For more technical details about the limitations of these data, refer to the metadata. Accuracy information for CDL and NASS can be found on their respective web sites.

## Selected Publications

1. Meyer, L., S. MacDonald, and J. Kiawu. 2013. [Cotton and wool](#). U.S. Department of Agriculture, Economic Research Service, Washington, D.C. Accessed September 2015.
  2. Statista. 2016. [Leading 10 U.S. states for cotton production in 2015](#). Accessed May 2016.
  3. Kusmin, L. 2012. [Rural America at a glance: 2012 edition](#). Economic Brief No. 21 (EB-21). U.S. Department of Agriculture, Economic Research Service, Washington, D.C.
- Dorminey, B. 2012. [Dryland farmers work wonders without water in the U.S. West](#). Environmental Health Sciences, *The Daily Climate*. Accessed May 2016.
- Fuglie, K. O., E. Ball, and J. M. MacDonald. 2007. [Productivity growth in U.S. agriculture](#). Economic brief number 9. Economic Research Service, U.S. Department of Agriculture.
- Nordstrom, K.F., and S. Hotta. 2004. [Wind erosion from cropland in the USA: A review of problems, solutions, and prospects](#). *Geoderma* 121: 157–167.
- O'Donoghue, E., R. Hoppe, D.E. Banker, R. Ebel, K. Fuglie, P. Korb, M. Livingston, C. Nickerson, and C. Sandretto. 2011. [The changing organization of U.S. farming](#). U.S. Department of Agriculture, Economic Research Service, Washington, D.C.

## How can I access these data?

EnviroAtlas data can be viewed in the interactive map, accessed through web services, or downloaded. The Cropland Data Layer (CDL) is available from the U.S. Department of Agriculture. Yield estimates by crop can be obtained from the National Agricultural Statistics Service ([NASS](#)).

## Where can I get more information?

There are numerous resources available on cotton and agriculture in general; a selection of these resources is listed below. For additional information on how the data were created, access the metadata for the data layer from the drop down menu on the interactive map table of contents and click again on metadata at the bottom of the metadata summary page for more details. To ask specific questions about this data layer, please contact the [EnviroAtlas Team](#).

## Acknowledgments

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